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ANIMAL PARASITES OF RATS AT MADISON, WISCONSIN

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According to Blandford, the so-called brown rat, *Mus norvegicus*, came originally from Central Asia, but has spread until it inhabits practically every civilized portion of the world with the exception of South America. This rat is extremely savage and very cunning, adapting itself readily to meet different conditions of life. It seems to thrive in all climates, and is found in Iceland as well as in India. The observations to be noted in this paper were limited to the examination of twenty-five rats captured in Madison, Wisconsin, for the purpose of learning what parasites they were carrying.

Of the rats examined, seven came from a fraternity house, fifteen from a dump in the Italian district, and three were trapped on a dump near the University. All carried parasites: thirteen (53%), fleas; fifteen (60%), lice; three (12%), mites; twenty-two (88%), intestinal round worms; one (4%), trichina, and five (20%), the dwarf tapeworm. I was unable to find any blood parasites in the rats examined, but I have seen slides of *Trypanosoma lewisi* from rats captured in Madison by Dr. William Middleton in 1916.

LIST CF PARASITES FOUND

Haematopinus spinulosus Burm. Rat Louse

This louse is common on rats and has not been reported from other hosts. It transmits an apparently non-pathogenic protozoan parasite, *Trypanosoma lewisi*, from one rat to another.

Ctenocephalus canis Curtis. Dog Flea

This is the most common flea infesting houses in the eastern United States. It attacks man and most of the domestic animals. It is readily transmitted from one locality to another through the agency of rats. As it attacks both rodents and man it can readily become a transmitter of the plague. It was shown by Grassi that this flea could be the intermediate host of the tapeworm *Dipylidium caninum*.

Ceratophyllus fasciatus Bosc. Rat Flea

This is strictly a rat flea in that it requires rat blood as a food in order to reproduce. However, it was found by Strickland that while this flea completes its life cycle only on the rat, it bites man in preference to rats when given the choice. This fact makes it an important factor in plague-infected localities.

Laelaps agilis Koch. Mite

This mite is found commonly on the rat in small numbers. It is apparently of little economic importance, not commonly attaching itself to man or to domestic animals.

Trichinella spiralis Owen. Trichina

From an economic standpoint this worm is without doubt the most important parasite carried by the rat, at least in the United States where plague is not prevalent. Trichina is conveyed from rat to pig, and, by eating uncooked or imperfectly cooked pork, from pig to man. It sometimes causes severe and very fatal epidemics and necessitates large expenditures for meat inspection.

Heterakis spumosa Schneider.* Roundworm

This nematode is common in the cecum of the rat and is of world-wide distribution. It is of practically no economic importance being exclusively a parasite of the rat and apparently not affecting it to any extent. I examined rats which appeared to be enjoying the best of health and which had hundreds of these worms packed in the cecum.

Hymenoleps diminuta Rudolphi. Dwarf Tapeworm

The cystocercoid of the dwarf tapeworm develops in the body cavity of a number of meal-infesting insects. Grassi believes that the caterpillars of Lepidoptera are the usual intermediate hosts. The insects take up the eggs scattered by rats. It has been experimentally demonstrated that men may develop this tapeworm by swallowing infected insects. According to various texts, natural infection probably occurs by ingesting such insects with cereals or imperfectly cooked foods.

Through its migratory habits, its varied diet, and its intimate association with man, the rat is of considerable importance as a carrier and transmitter of parasites. The investigation in this instance has been rather limited. A survey of the literature shows that over eighty species of parasites have been reported from a number of different localities and are apparently common to the rat. All the parasites found in the rats captured in Madison have been reported as occurring in other localities. The finding of trichina in this neighborhood emphasizes the importance of a rigid inspection of the pork. The species of fleas found on the rats of Madison are all capable of transmitting *Bacillus pestis* and might be of importance in case of a plague epidemic.

REFERENCE

Shipley, A. E. 1908. Rats and Their Animal Parasites. Jour. Econ. Biol.. 3:61-83; 4:19.

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* For the identification of this nematode I am indebted to Dr. B. H. Ransom.